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EXAMINER	
ZEILBERGER, DANIEL	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/670,698	**Applicant(s)** BOSSEN, FRANK JAN	
	Examiner DANIEL ZEILBERGER	**Art Unit** 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 July 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6-16,18-28,30-34,37-39,41-43 and 45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-16,18-28,30-34,37-39,41-43 and 45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/16/09, 09/09/09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This office action is in response to the Applicant's reply dated July 6th 2009.

Response to Arguments

1. Applicant's arguments filed July 6th 2009 have been fully considered but they are not persuasive.

It is first noted that the arguments with respect to prior art rejections of claims 10, 22, 31-34, 37-39, 41-43 and 45 are moot as the prior art rejections with respect to these claims are not moot (see reasons for allowance below; also note 35 U.S.C. § 112 and 35 U.S.C. § 101 rejections still pending of some of these claims).

Applicant argues against the 35 U.S.C § 112 rejection of claims 1, 13, 25, 30, 31, 37, 41 and 45 stating in part that "an 'index' and 'indexing' are given different meanings in the claims. An 'index' is computed and used for indexing the LUT. 'Indexing' is an operation to locate a scaling factor in the LUT, using the index" (at pages 12-13 of Applicant's reply).

The Examiner respectfully disagrees. As the Applicant states, which is correct, a LUT is indexed using an index. The claim currently provides for an index to be a function of three variables, one of which is block size, and then this index is used for indexing the LUT. This could be written functionally as LUT(index(x1,x2,x3)). Thus one of the parameters of the index (i.e. x1) would be the size of the block of coefficients. Since the indexing utilizes the index, the indexing will necessarily be dependent on the size of the block of coefficients. There is no possible way for the indexing to be

independent of the size of the block if the index which is essential for indexing is based on the size of the block. While Applicant states that once the index is computed, it is just an integer number and does not distinguish the sizes of a block, that does not change the fact that the computed index is dependent upon the size of the block, and thus the indexing is dependent upon the size of the block.

Applicant further argues against the 35 U.S.C. § 101 rejection of claims 1-12 and 31-34, arguing that “claims 1-12 and 31-34 are directed to transformation of raw data into a particular visual depiction of a physical object on a display. The raw dat[a] in the present invention is ‘a block of coefficients representative of a block of video information which has been transformed and quantized for compression of the video information’. The video information recited in the claim is visual data representing a moving physical object and not a computer created visual data (computer created visual data is not going through transformation or quantization). In the present invention, this raw data is sufficiently transformed by inverse quantization and transform (‘in order to reconstruct a signal of the block video information for display of the video signal’)” (at page 13 of Applicant’s reply).

The Examiner respectfully disagrees. Specifically, while the Applicant states that “the video information recited in the claim is visual data representing a moving physical object”, there is nothing the claim that provides such a limitation. Further, while Applicant states that the data is transformed into "a particular visual depiction of a physical object on a display", the claim only provides for transforming the data ***for***

display; that is, the display is not positively recited, but is a mere intended use of the data. If both of the prior limitations were positively recited in the claim, then the Applicant would likely be correct that the claims satisfy 35 U.S.C. § 101. However, the claims lack both features that are argued, and thus do not satisfy 35 U.S.C. § 101.

Applicant further argues that “the Wiegand index is based on a quantization parameter and the position of each coefficient only” and that ‘Wiegand is silent about ‘indexing the LUT, using the computed index, to determine a scaling factor in the LUT applicable for scaling of said each coefficient, wherein indexing is independent of a block size’” (at pages 14-15 of Applicants reply).

The Examiner respectfully disagrees. The Applicant appears to have taken the arbitrary stance of pulling out the block size from the index of Wiegand and saying that the block size is part of the indexing operation. There is no justification for doing this, and indeed the interpretation by the Examiner is more in line with the Applicant's specification. To illustrate, Wiegand provides for computing LUT(index(x1,x2,x3)), wherein for illustration x1 can be considered block size. There is no reason not to consider the block size in Wiegand as part of the index. The claim as written does not in any form restrict the index to being a single 0-dimensional value computed from the quantization parameter, size of the block of coefficients, and position of the coefficient, which is what appears to be the idea in the specification.

Applicant further argues that the table 14-1 contains three separate matrixes, that the Examiner interprets the table to be one matrix, and that this contradicts the rejection of claim 8 (at page 15 of Applicant's specification).

The Examiner respectfully disagrees. First, referring to table 14-1 as one matrix or three matrices appear to both be valid interpretations; one could break down any matrix into sub-matrices. However, the Examiner points out that the applicant has claimed a single look-up table, and there is no reason why table 14-1 could not have been interpreted as a single look-up table, since all of the sub-matrices that make up table 14-1 are used for the same purpose. As to the alleged contradiction made by rejecting claim 8, the Examiner points out that claim 8 says that the "array" of claim 6, not the look-up table of claim 1, is one-dimensional. The Examiner has taken the position that the array is the sub-matrix for mode 8x8, which is one-dimensional.

Applicant appears to recite essentially the same arguments as to claim 2 as above with reference to distinguishing the “index” from “indexing”, and the Examiner respectfully disagrees for the same reasoning.

Applicant applies the same arguments to various other pending claims, and the Examiner respectfully disagrees for the reasoning above.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. *Claims 1, 13, 25, 30, 31, 37, 41 and 45* rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding **claim 1**, the claim contains the limitations of "**computing an index for each coefficient, the index being a function of** a quantization parameter, **a size of the block of coefficients**, and a position of said each coefficient within the block; **indexing the LUT**, using the computed index, to determine a scaling factor in the LUT applicable for scaling of said each coefficient, **wherein indexing is independent of a size of the block**". However, it is not clear how an index can be computed based on "a size of the block of coefficients" and then a LUT is indexed, using that very same index, "wherein indexing is independent of a size of the block". It would appear that if an index that is a function of block size is used in indexing a LUT, indexing would necessarily be dependent upon block size. In addition, the Examiner cannot find anywhere in the originally filed specification that clarifies the apparent discrepancy. **Appropriate correction required**, however for the purposes of examination, the claim limitation of "indexing the LUT, using the computed index, to determine a scaling factor in the LUT applicable for scaling of said each coefficient, **wherein indexing is independent of a size of the block**" will be interpreted as --indexing the LUT, **regardless of the size of the block**, using the computed index, to determine a scaling factor in the LUT applicable for scaling of said each coefficient--. Independent **claims 13, 25, 30, 31, 37, 41 and 45** contain essentially the same limitations as above, and are rejected for the same reasoning as above.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-12 and 31-34 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. Supreme Court precedent[1] and recent Federal Circuit decisions[2] indicate that a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. Specifically, each of the individual steps in the process claims could be performed mentally and none of the steps are necessarily tied to another statutory category, and further the claimed process does not transform an underlying subject matter.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

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[1] *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

[2] *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

6. *Claims 1-4, 6-9, 11 and 12* are rejected under 35 U.S.C. 103(a) as being unpatentable over Wiegand ("Joint Committee Draft (CD)")in view of Ohki (US Patent 5,519,503), hereinafter referenced as Wiegand and Ohki, respectively.

Regarding **claim 1**, Wiegand discloses a decoding process (see section 14.3, wherein a scaling and inverse transform for ABT blocks is disclosed), comprising:

providing a single look-up table (LUT) which consists of a single group of scaling factors applicable for scaling of coefficients of different block sizes (see section 14.3.2.2, wherein it is disclosed that the group of ABT dequantization mantissa values used in Table 14-1 are applicable for block sizes 4x4, 4x8, 8x4 and 8x8);

computing an index for each coefficient, the index being a function of a quantization parameter, a size of the block of coefficients, and a position of said each coefficient within the block (see section 14.3.2.2, wherein for each scaling operation, in order to determine R(QP%6, i, j), it is necessary to use the values of QP, block size, and coefficient position i, j to address the look-up table 14-1, as shown in table 14-1 and modes 4x4, 4x8, 8x4 and 8x8, and thus QP, block size, and coefficient position i,j are elements of an index used to access a value in Table 14-1);

indexing the LUT, using the computed index, to determine a scaling factor in the LUT applicable for scaling of said each coefficient, wherein indexing is independent of a size of the block (see 35 USC 112 2nd paragraph rejection above, and further see section 14.3.2.2, wherein for each scaling operation, in order to determine R(QP%6, i, j), it is necessary to use the values of QP, block size, and coefficient position i, j to

address the look-up table 14-1, wherein table 14-1 is used regardless of whether the block size is 4x4, 4x8, 8x4 or 8x8);

scaling the block of received coefficients, using the determined scaling factors, to inversely quantize the block of received coefficients (see section 14.3.2.2, wherein equation 14-3 is used to scale an MxN block of coefficients, wherein a coefficient YQ(i,j) is scaled by R(QP%6, i, j), such that for each scaling operation, in order to determine R(QP%6, i, j), index parameters i, j, QP, and block size are required to address the look-up table 14-1, as shown in table 14-1 and modes 8x8, 8x4, 4x8, 4x4); and

inversely transform the block of scaled coefficients in order to reconstruct a signal of the block of video information for display of the video signal (see section 14.3.2, wherein as shown in section 14.3.2.2 the matrix of scaled coefficients YD(i,j) are inverse transformed first horizontally and then vertically to obtain a final decoded result S'(i,j)).

Wiegand fails to specifically disclose "receiving a block of coefficients relating to a block of video information to be displayed which has been transformed and quantized for compression of the video information". However, the Examiner maintains that it would have been obvious, in view of Ohki, to provide:

receiving a block of coefficients relating to a block of video information to be displayed which has been transformed and quantized for compression of the video information (see figure 8 and column 11 lines 34-67, wherein before dequantization and inverse transformation, transformation and quantization occurs, wherein the

dequantization and inverse transformation occurs in order to display the contents of the data).

Therefore, the Examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically providing “receiving a block of coefficients relating to a block of video information to be displayed which has been transformed and quantized for compression of the video information”, as taught by Ohki, for the purpose of implementing the method of Wiegand with actual data that had been originally transformed and quantized, since for Wiegand to dequantize and inverse transform data, for the result to be meaningful the data must have been originally transformed and quantized, wherein the dequantization and inverse transformation provide the desired ability to display the picture data.

Regarding **claim 2**, Wiegand further discloses:

wherein the index is the sum of a modulo from the the quantization parameter and a first value determined by block size of the block of coefficients and the position of said each coefficient within the block (see equation 14-3 and table 14-1 and modes 8x8, 8x4, 4x8, 4x4, wherein in order to index the lookup table 14-1, the combination (i.e. the sum) of the quantization parameter (QP) modulo 6, the block size (i.e. 8x8, 8x4, 4x8, or 4x4), and the position of the coefficient (i.e. (i, j)), are required).

Regarding **claim 3**, Wiegand further discloses:

wherein the first value is the sum of a second value determined by the vertical size of the block and the vertical position of said each coefficient within the block and a third value determined by the horizontal size of the block and the horizontal position of said each coefficient within the block (see equation 14-3 and table 14-1 and modes 8x8, 8x4, 4x8, 4x4, wherein in order to index the lookup table 14-1, the combination (i.e. the sum) of the block size (i.e. 8x8, 8x4, 4x8, or 4x4), and the position of the coefficient (i.e. (i, j)), are required, wherein as evidenced by differing modes 4x8 and 8x4, not only does the actual block size affect the indexing but also specifically the vertical size and the horizontal size, and further wherein coordinates i and j refer to the coefficients vertical and horizontal position within the block).

Regarding **claim 4**, Wiegand further discloses:

wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8 (see section 14.3.2.2, wherein modes 8x8, 8x4, 4x8, and 4x4 are disclosed).

Regarding **claim 6**, Wiegand further discloses:

determining an offset of an array according to the position of said each coefficient; determining an inverse quantization value for said each coefficient based on the offset (see section 14.3.2.2 and equation 14-3 and table 14-1 and modes 8x8, 8x4, 4x8, and 4x4, wherein according to the coefficient position, a particular column of a particular S table of the table 14-1 is selected, wherein the output of the table 14-1 determines the inverse quantization value for the coefficient).

Regarding **claim 7**, Wiegand further discloses:

wherein entries of the array are of a form pow(2, (k+O)/12), where k represents a position of an individual entry in the array and O is a constant (see table 14-1, wherein all of the values in the table 14-1 can be represented by the form pow(2, x), since any number can be represented by pow(2, x), and thus an appropriate k value will exist for any number such that the number will equal pow(2, (k+O)/12), and further since each column is increasing as the position increases, k will be increasing as the position increases and thus will represent the position of an individual entry, such as for the first column wherein a selection of O=47.3 would result in k values equal to 0, 2, 4, 6, 8, and 10, in order to achieve the exhibited values).

Regarding **claim 8**, Wiegand further discloses:

wherein the array is a 1-dimensional (l-D) (see section 14.3.2.2, table 14-1, wherein in the mode 8x8, S_{8x8} is 1-dimensional).

Regarding **claim 9**, Wiegand further discloses:

wherein inversely transform the block of scaled coefficients comprises: applying a vertical transform to the block of scaled coefficients; and applying a horizontal transform to block of scaled coefficients (see section 14.3.2.2, wherein a horizontal transform is applied in equation 14-4, and a vertical transform is then applied in equation 14-6).

Regarding **claim 11**, Wiegand discloses everything as applied above in regards to claim 1. Wiegand fails to disclose “wherein inversely transform the block of scaled coefficients comprises computing the inverse transform using only a sequence of addition, subtraction, and shift operations”. However, the examiner maintains that it would have been obvious, in view of Ohki, to provide:

wherein inversely transform the block of scaled coefficients comprises computing the inverse transform using only a sequence of addition, subtraction, and shift operations (see column 9 lines 4-17, wherein a transform is disclosed that makes use of only addition and subtraction circuits, without employing multiplication circuits, such that the circuit scale may be simplified).

Therefore, the examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically providing “wherein inversely transform the block of scaled coefficients comprises computing the inverse transform using only a sequence of addition, subtraction, and shift operations”, as taught by Ohki, for the purpose of simplifying the circuit scale.

Regarding **claim 12**, Wiegand further discloses:

wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8 (see section 14.3.2.2, wherein modes 8x8, 8x4, 4x8, and 4x4 are disclosed).

7. *Claims 13-16, 18-21, 23 and 24* are rejected under 35 U.S.C. 103(a) as being unpatentable over Wiegand, in view of Ohki, and further in view of McMillan, Jr. et al. (US Patent 5,224,062), hereinafter referenced as McMillan.

Regarding **claim 13**, Wiegand discloses a computer-implemented decoder for decoding a block of coefficients (see section 14.3, wherein a scaling and inverse transform for ABT blocks is disclosed) comprising:

a single look-up table (LUT) which consists of a single group of scaling factors applicable for scaling of coefficients of different block sizes (see section 14.3.2.2, wherein it is disclosed that the group of ABT dequantization mantissa values used in Table 14-1 are applicable for block sizes 4x4, 4x8, 8x4 and 8x8);

an index calculator configured to compute an index for each coefficient, the index being a function of a quantization parameter, a size of the block of coefficients, and a position of said each coefficient within the block (see section 14.3.2.2, wherein for each scaling operation, in order to determine R(QP%6, i, j), it is necessary to use the values of QP, block size, and coefficient position i, j to address the look-up table 14-1, as shown in table 14-1 and modes 4x4, 4x8, 8x4 and 8x8, and thus QP, block size, and coefficient position i,j are elements of an index used to access a value in Table 14-1);

an indexer configured to index the LUT, using the computed index, to determine a scaling factor in the LUT applicable for scaling of said each coefficient, wherein indexing is independent of a size of the block (see 35 USC 112 2nd paragraph rejection above, and further see section 14.3.2.2, wherein for each scaling operation, in order to

determine R(QP%6, i, j), it is necessary to use the values of QP, block size, and coefficient position i, j to address the look-up table 14-1, wherein table 14-1 is used regardless of whether the block size is 4x4, 4x8, 8x4 or 8x8);

a scaler configured to scale the block of received coefficients, using the determined scaling factors, to inversely quantize the block of received coefficients (see section 14.3.2.2, wherein equation 14-3 is used to scale an MxN block of coefficients, wherein a coefficient YQ(i,j) is scaled by R(QP%6, i, j), such that for each scaling operation, in order to determine R(QP%6, i, j), index parameters i, j, QP, and block size are required to address the look-up table 14-1, as shown in table 14-1 and modes 8x8, 8x4, 4x8, 4x4); and

an inverse transformer configured to inversely transform the block of scaled coefficients in order to reconstruct a signal of the block of video information for display of the video signal (see section 14.3.2, wherein as shown in section 14.3.2.2 the matrix of scaled coefficients YD(i,j) are inverse transformed first horizontally and then vertically to obtain a final decoded result S'(i,j)).

Wiegand fails to specifically disclose "a computer-implemented decoder for decoding a block of coefficients relating to a block of video information to be displayed which has been transformed and quantized for compression of the video information". However, the Examiner maintains that it would have been obvious, in view of Ohki, to provide:

a computer-implemented decoder for decoding a block of coefficients relating to a block of video information to be displayed which has been transformed and quantized

for compression of the video information (see figure 8 and column 11 lines 34-67, wherein before dequantization and inverse transformation, transformation and quantization occurs, wherein the dequantization and inverse transformation occurs in order to display the contents of the data).

Therefore, the Examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically providing “a computer-implemented decoder for decoding a block of coefficients relating to a block of video information to be displayed which has been transformed and quantized for compression of the video information”, as taught by Ohki, for the purpose of implementing the method of Wiegand with actual data that had been originally transformed and quantized, since for Wiegand to dequantize and inverse transform data, for the result to be meaningful the data must have been originally transformed and quantized, wherein the dequantization and inverse transformation provide the desired ability to display the picture data.

Wiegand also fails to specifically disclose “a memory which stores” the single look-up table. However, the Examiner maintains that it would have been obvious, in view of McMillan, to provide:

“a memory which stores” the single look-up table (see column 6 line 62 through column 7 line 6, wherein it is disclosed that a memory 20 is used to store a plurality of look-up tables for the CPU 18 to perform dequantization of the input values and scalings of their reconstruction kernels, when performing inverse discrete cosine transformation).

Therefore, the Examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically providing “a memory which stores” the single look-up table, as taught by McMillan, for the purpose of allowing the look-up table to actual be used in a hardware computer environment such that the look-up table can be accessed by a CPU.

Regarding **claim 14**, Wiegand further discloses:

wherein the index is the sum of a module from the quantization parameter and a first value determined by block size of the block of coefficients and the position of said each coefficient within the block (see equation 14-3 and table 14-1 and modes 8x8, 8x4, 4x8, 4x4, wherein in order to index the lookup table 14-1, the combination (i.e. the sum) of the quantization parameter (QP) modulo 6, the block size (i.e. 8x8, 8x4, 4x8, or 4x4), and the position of the coefficient (i.e. (i, j)), are required).

Regarding **claim 15**, Wiegand further discloses:

wherein the first value is the sum of a second value determined by the vertical size of the block and the vertical position of said each coefficient within the block and a third value determined by the horizontal size of the block and the horizontal position of said each coefficient within the block (see equation 14-3 and table 14-1 and modes 8x8, 8x4, 4x8, 4x4, wherein in order to index the lookup table 14-1, the combination (i.e. the sum) of the block size (i.e. 8x8, 8x4, 4x8, or 4x4), and the position of the coefficient (i.e. (i, j)), are required, wherein as evidenced by differing modes 4x8 and 8x4, not only does

the actual block size affect the indexing but also specifically the vertical size and the horizontal size, and further wherein coordinates i and j refer to the coefficients vertical and horizontal position within the block).

Regarding **claim 16**, Wiegand further discloses:

wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8 (see section 14.3.2.2, wherein modes 8x8, 8x4, 4x8, and 4x4 are disclosed).

Regarding **claim 18**, Wiegand further discloses:

wherein the scaler scales the block of received coefficients using a scaling factor by determining an offset of an array according to the position of said each coefficient; determining an inverse quantization value for said each coefficient based on the offset (see section 14.3.2.2 and equation 14-3 and table 14-1 and modes 8x8, 8x4, 4x8, and 4x4, wherein according to the coefficient position, a particular column of a particular S table of the table 14-1 is selected, wherein the output of the table 14-1 determines the inverse quantization value for the coefficient).

Regarding **claim 19**, Wiegand further discloses:

wherein entries of the array are of a form pow(2, (k+O)/12), where k represents a position of an individual entry in the array and O is a constant (see table 14-1, wherein all of the values in the table 14-1 can be represented by the form pow(2, x), since any number can be represented by pow(2, x), and thus an appropriate k value will exist for

any number such that the number will equal pow(2, (k+O)/12), and further since each column is increasing as the position increases, k will be increasing as the position increases and thus will represent the position of an individual entry, such as for the first column wherein a selection of O=47.3 would result in k values equal to 0, 2, 4, 6, 8, and 10, in order to achieve the exhibited values).

Regarding **claim 20**, Wiegand further discloses:

wherein the array is a 1-dimensional (I-D) (see section 14.3.2.2, table 14-1, wherein in the mode 8x8, S_{8x8} is 1-dimensional).

Regarding **claim 21**, Wiegand further discloses:

wherein the inverse transformer inversely transforms the block of scaled coefficients by applying a vertical transform to the block of scaled coefficients; and applying a horizontal transform to block of scaled coefficients (see section 14.3.2.2, wherein a horizontal transform is applied in equation 14-4, and a vertical transform is then applied in equation 14-6).

Regarding **claim 23**, Wiegand discloses everything as applied above in regards to claim 13. Wiegand fails to disclose “wherein the inverse transformer computes the inverse transform using only a sequence of addition, subtraction, and shift operations”. However, the examiner maintains that it would have been obvious, in view of Ohki, to provide:

wherein the inverse transformer computes the inverse transform using only a sequence of addition, subtraction, and shift operations (see column 9 lines 4-17, wherein a transform is disclosed that makes use of only addition and subtraction circuits, without employing multiplication circuits, such that the circuit scale may be simplified).

Therefore, the examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically providing “wherein the inverse transformer computes the inverse transform using only a sequence of addition, subtraction, and shift operations”, as taught by Ohki, for the purpose of simplifying the circuit scale.

Regarding **claim 24**, Wiegand further discloses:

wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8 (see section 14.3.2.2, wherein modes 8x8, 8x4, 4x8, and 4x4 are disclosed).

8. *Claims 25-28* are rejected under 35 U.S.C. 103(a) as being unpatentable over Wiegand in view of Ohki, and further in view of Boon et al. (US Patent 6,574,368), hereinafter referenced as Boon.

Regarding **claim 25**, Wiegand discloses to:

provide a single look-up table (LUT) which consists of a single group of scaling factors applicable for scaling of coefficients of different block sizes (see section

14.3.2.2, wherein it is disclosed that the group of ABT dequantization mantissa values used in Table 14-1 are applicable for block sizes 4x4, 4x8, 8x4 and 8x8);

compute an index for each coefficient, the index being a function of a quantization parameter, a size of the block of coefficients, and a position of said each coefficient within the block (see section 14.3.2.2, wherein for each scaling operation, in order to determine R(QP%6, i, j), it is necessary to use the values of QP, block size, and coefficient position i, j to address the look-up table 14-1, as shown in table 14-1 and modes 4x4, 4x8, 8x4 and 8x8, and thus QP, block size, and coefficient position i,j are elements of an index used to access a value in Table 14-1);

index the LUT, using the computed index, to determine a scaling factor in the LUT applicable for scaling of said each coefficient, wherein indexing is independent of a size of the block (see 35 USC 112 2nd paragraph rejection above, and further see section 14.3.2.2, wherein for each scaling operation, in order to determine R(QP%6, i, j), it is necessary to use the values of QP, block size, and coefficient position i, j to address the look-up table 14-1, wherein table 14-1 is used regardless of whether the block size is 4x4, 4x8, 8x4 or 8x8);

scale the block of received coefficients, using the determined scaling factors, to inversely quantize the block of received coefficients (see section 14.3.2.2, wherein equation 14-3 is used to scale an MxN block of coefficients, wherein a coefficient YQ(i,j) is scaled by R(QP%6, i, j), such that for each scaling operation, in order to determine R(QP%6, i, j), index parameters i, j, QP, and block size are required to address the look-up table 14-1, as shown in table 14-1 and modes 8x8, 8x4, 4x8, 4x4); and

inversely transform the block of scaled coefficients in order to reconstruct a signal of the block of video information for display of the video signal (see section 14.3.2, wherein as shown in section 14.3.2.2 the matrix of scaled coefficients YD(i,j) are inverse transformed first horizontally and then vertically to obtain a final decoded result S'(i,j)).

Wiegand fails to specifically disclose "receive a block of coefficients relating to a block of video information to be displayed which has been transformed and quantized for compression of the video information". However, the Examiner maintains that it would have been obvious, in view of Ohki, to provide:

receive a block of coefficients relating to a block of video information to be displayed which has been transformed and quantized for compression of the video information (see figure 8 and column 11 lines 34-67, wherein before dequantization and inverse transformation, transformation and quantization occurs, wherein the dequantization and inverse transformation occurs in order to display the contents of the data).

Therefore, the Examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically providing "receive a block of coefficients relating to a block of video information to be displayed which has been transformed and quantized for compression of the video information", as taught by Ohki, for the purpose of implementing the method of Wiegand with actual data that had been originally transformed and quantized, since for Wiegand to dequantize and inverse transform data, for the result to be meaningful the data must

have been originally transformed and quantized, wherein the dequantization and inverse transformation provide the desired ability to display the picture data.

Wiegand also fails to expressly disclose implementing the above steps with a computer-readable medium storing instructions which, when executed by a system, cause the system to perform the steps. However, the examiner maintains that it would have been obvious, in view of Boon, to provide:

a computer-readable medium storing instructions which, when executed by a system, cause the system to perform the steps (see Boon column 29 lines 48-54).

Therefore, the examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically providing “a computer-readable medium storing instructions which, when executed by a system, cause the system to perform the steps” perform the above recited steps, as taught by Boon, for the purpose of ensuring a high computational speed, the capability of program algorithm modification without changing hardware, and to provide the ability for the decoding algorithm to be disseminated and used by the millions of people who have access to computers.

Regarding **claim 26**, Wiegand further discloses:

wherein the index is the sum of a modulo from the quantization parameter and a first value determined by block size of the block of coefficients and the position of said each coefficient within the block (see equation 14-3 and table 14-1 and modes 8x8, 8x4, 4x8, 4x4, wherein in order to index the lookup table 14-1, the combination (i.e. the sum)

of the quantization parameter (QP) modulo 6, the block size (i.e. 8x8, 8x4, 4x8, or 4x4), and the position of the coefficient (i.e. (i, j)), are required).

Regarding **claim 27**, Wiegand further discloses:

wherein the first value is the sum of a second value determined by the vertical size of the block and the vertical position of said each coefficient within the block and a third value determined by the horizontal size of the block and the horizontal position of said each coefficient within the block (see equation 14-3 and table 14-1 and modes 8x8, 8x4, 4x8, 4x4, wherein in order to index the lookup table 14-1, the combination (i.e. the sum) of the block size (i.e. 8x8, 8x4, 4x8, or 4x4), and the position of the coefficient (i.e. (i, j)), are required, wherein as evidenced by differing modes 4x8 and 8x4, not only does the actual block size affect the indexing but also specifically the vertical size and the horizontal size, and further wherein coordinates i and j refer to the coefficients vertical and horizontal position within the block).

Regarding **claim 28**, Wiegand further discloses:

wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8 (see section 14.3.2.2, wherein modes 8x8, 8x4, 4x8, and 4x4 are disclosed).

9. *Claim 30* are rejected under 35 U.S.C. 103(a) as being unpatentable over Wiegand in view of Ohki, and further in view of Boon, and further in view of McMillan.

Regarding **claim 30**, Wiegand discloses to:

provide a single look-up table (LUT) which consists of a single group of scaling factors applicable for scaling of coefficients of different block sizes (see section 14.3.2.2, wherein it is disclosed that the group of ABT dequantization mantissa values used in Table 14-1 are applicable for block sizes 4x4, 4x8, 8x4 and 8x8);

compute an index for each coefficient, the index being a function of a quantization parameter, a size of the block of coefficients, and a position of said each coefficient within the block (see section 14.3.2.2, wherein for each scaling operation, in order to determine R(QP%6, i, j), it is necessary to use the values of QP, block size, and coefficient position i, j to address the look-up table 14-1, as shown in table 14-1 and modes 4x4, 4x8, 8x4 and 8x8, and thus QP, block size, and coefficient position i,j are elements of an index used to access a value in Table 14-1);

index the LUT, using the computed index, to determine a scaling factor in the LUT applicable for scaling of said each coefficient, wherein indexing is independent of a size of the block (see 35 USC 112 2nd paragraph rejection above, and further see section 14.3.2.2, wherein for each scaling operation, in order to determine R(QP%6, i, j), it is necessary to use the values of QP, block size, and coefficient position i, j to address the look-up table 14-1, wherein table 14-1 is used regardless of whether the block size is 4x4, 4x8, 8x4 or 8x8);

scale the block of received coefficients, using the determined scaling factors, to inversely quantize the block of received coefficients (see section 14.3.2.2, wherein equation 14-3 is used to scale an MxN block of coefficients, wherein a coefficient YQ(i,j) is scaled by R(QP%6, i, j), such that for each scaling operation, in order to determine

R(QP%6, i, j), index parameters i, j, QP, and block size are required to address the look-up table 14-1, as shown in table 14-1 and modes 8x8, 8x4, 4x8, 4x4); and

inversely transform the block of scaled coefficients in order to reconstruct a signal of the block of video information for display of the video signal (see section 14.3.2, wherein as shown in section 14.3.2.2 the matrix of scaled coefficients YD(i,j) are inverse transformed first horizontally and then vertically to obtain a final decoded result S'(i,j)).

Wiegand fails to specifically disclose "a block of coefficients relating to a block of video information to be displayed which has been transformed and quantized for compression of the video information". However, the Examiner maintains that it would have been obvious, in view of Ohki, to provide:

a block of coefficients relating to a block of video information to be displayed which has been transformed and quantized for compression of the video information (see figure 8 and column 11 lines 34-67, wherein before dequantization and inverse transformation, transformation and quantization occurs, wherein the dequantization and inverse transformation occurs in order to display the contents of the data).

Therefore, the Examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically providing "a block of coefficients relating to a block of video information to be displayed which has been transformed and quantized for compression of the video information", as taught by Ohki, for the purpose of implementing the method of Wiegand with actual data that had been originally transformed and quantized, since for Wiegand to

dequantize and inverse transform data, for the result to be meaningful the data must have been originally transformed and quantized, wherein the dequantization and inverse transformation provide the desired ability to display the picture data.

Wiegand also fails to expressly disclose implementing the above steps using a decoding apparatus comprising the "means for" performing the various steps of the claim. However, the examiner maintains that it would have been obvious, in view of Boon, to provide:

a decoding apparatus comprising the "means for" performing the various steps of the claim (see Boon column 29 lines 48-54).

Therefore, the examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically providing a decoding apparatus comprising the "means for" performing the various steps of the claim, as taught by Boon, for the purpose of ensuring a high computational speed, the capability of program algorithm modification without changing hardware, and to provide the ability for the decoding algorithm to be disseminated and used by the millions of people who have access to computers.

Wiegand also fails to specifically disclose "storing" the single look-up table. However, the Examiner maintains that it would have been obvious, in view of McMillan, to provide:

"storing" the single look-up table (see column 6 line 62 through column 7 line 6, wherein it is disclosed that a memory 20 is used to store a plurality of look-up tables for

the CPU 18 to perform dequantization of the input values and scalings of their reconstruction kernels, when performing inverse discrete cosine transformation).

Therefore, the Examiner maintains that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wiegand, by specifically providing “storing” the single look-up table, as taught by McMillan, for the purpose of allowing the look-up table to actual be used in a hardware computer environment such that the look-up table can be accessed by a CPU.

Allowable Subject Matter

10. Claim 10 would be allowable if rewritten to overcome the rejection under 35 U.S.C. 101, and the rejection under 35 U.S.C. 112, 2nd paragraph of claim 1, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

11. Claim 22 would be allowable if rewritten to overcome the rejection under 35 U.S.C. 112, 2nd paragraph of claim 13, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

12. Claims 31-34 would be allowable if rewritten or amended to overcome the rejections under 35 U.S.C. 101 and 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

13. Claims 41-43 and 45 would be allowable if rewritten or amended to overcome the rejections under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

Regarding claims 10, 22, 31-34, 37-39, 41-43 and 45, the aforementioned claims recite, or depend from a claim that recites, a set of basis vectors that are used in the decoding transformation:

$$\begin{matrix} 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 12/8 & 10/8 & 6/8 & 3/8 & -3/8 & -6/8 & -10/8 & -12/8 \\ 1 & 1/2 & -1/2 & -1 & -1 & -1/2 & 1/2 & 1 \\ 10/8 & -3/8 & -12/8 & -6/8 & 6/8 & 12/8 & 3/8 & -10/8 \\ 1 & -1 & -1 & 1 & 1 & -1 & -1 & 1 \\ 6/8 & -12/8 & 3/8 & 10/8 & -10/8 & -3/8 & 12/8 & -6/8 \\ 1/2 & -1 & 1 & -1/2 & -1/2 & 1 & -1 & 1/2 \\ 3/8 & -6/8 & 10/8 & -12/8 & 12/8 & -10/8 & 6/8 & -3/8 \end{matrix}$$

. The Examiner agrees with the arguments that the Applicant has provided as to why the IDCT transformation taught by Ohki and previously utilized in rejecting the claims would not have led one of ordinary skill in the art to provide the basis vectors provided above. Since Ohki was the closest prior art found in regards to the above basis vectors, the aforementioned claims can no longer be rejected under prior art, when read in light of the other claim limitations provided therein.

Conclusion

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL ZEILBERGER whose telephone number is (571)270-3570. The examiner can normally be reached on M-F 8:00-4:30pm est.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on (571)272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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